

*** SVTC (video teleconference) with Hobbico set for 4/18/2013.

TylerHowell 4/17/2013 0:00 ** Q42, Q46, Q48 - Size sub C, 3000 mAh, NiMH rechargeable battery, from Tenergy
 *** Likely part of 7.2V, six cell battery pack for hobby-level RC vehicles.

* Received more images of two more PCBs (one with enclosure), PPT presentation created to explain electronics based on scene location (1 or 2):

* Scene 2

** Q122 - 2.4 GHz receiver by Spektrum, model: SR200 or SR201, for hobby-level RC vehicles.

*** SR200 is a discontinued model (as of 2013), SR201 is just a water-sealed variant [email from Horizon Hobby - unclass].

** Q41, Q52, Q138 - Duratrax Sprint ESC.

*** Q138 provides manf./model, also confirmed by SVTC with hobbico.

** Q42, Q46, Q48, Q115 - Size sub C, 3000 mAh, NiMH rechargeable battery, from Tenergy, 7.2V, likely "Tamiya" style connector.

* STVC Call with Hobbico:

** Confirmed that they are the seller of the Duratrax brand, including the Duratrax Spring ESC.

** Indicated that Q39, the blue ESC, could be from Hobby King under the brand of Turingy.

** Commented that transmitters from various manufacturers are typically not interoperable.

** Informed that the Spektrum brand is produced by Horizon Hobby.

TylerHowell 4/18/2013 0:00 ** Was unaware of custom transmitter/receiver designs on the internet (checked on 4/22/2013 - there are).
 * Eric Morefield tested the inter-operability of an exemplar Fly Sky transmitter and an exemplar Spektrum SR201 receiver.

** Exemplars could not talk to each other.

* Spektrum SR201 receiver instructions indicate the use of a Globally Unique Identifier.

TylerHowell 4/19/2013 0:00 ** Might be possible to attribute a transmitter and receiver.

		<ul style="list-style-type: none"> * Exemplar Spektrum DX2E transmitter purchased in Boston (BS) based on receipt attributed to living suspect. * "Preliminary info (unverified yet) is that the surviving bomber indicated the initiator was a christmas tree bulb..." ** Lab has a photograph of a lightbulb, but unknown if this was the initiator. * Spektrum SR201 receiver exemplar delivered to EEP ** Spektrum SR201 receiver main IC identified, can likely read the "GUID" (really just a PN spreading code for
TylerHowell	4/22/2013 0:00	<ul style="list-style-type: none"> DSSS) using SPI. * Ordered exemplars: ** 4 - Spektrum DX2E transmitters ** 4 - Spektrum SR201 receivers ** 4 - FlySky FS-GT3B transmitters ** 4 - FlySky FS-GR3E receivers ** 2 - Duratrax Spring ESC ** 2 - Helion Dominus ESC * SR201 main IC is a micro and radio in a single package. ** I2C bus for micro is broken out on the board (verified thru pinout/probing). ** Radio portion talks to micro over SPI, might be able to obtain access to SPI over I2C. ** Attached header to board, attempted to read using Arudino micro, did not work. ** Brandon Warhurst attempted to read, did not work.
TylerHowell	4/23/2013 0:00	<ul style="list-style-type: none"> ** Will need to debug reading process. * Received first round of exemplar Spektrum transmitter/receiver, Duratrax ESC ** Receiver is the same board revision as evidence. * Gary Baird stated RF testing of transmtiter/receiver. * Tested interoperability of Spektrum Tx and FS Rx
TylerHowell	4/24/2013 0:00	<ul style="list-style-type: none"> ** Devices are not interoperable. * Generated powerpoint presentation to aid in discovery of transmitter.
TylerHowell	4/25/2013 0:00	<ul style="list-style-type: none"> * Photographed evidence and exemplars.

- * Gary Baird measured RF spectrum on FlySky and Spektrum transmitters
- ** RF characteristics are different enough to prevent communication between systems.
- * Mo Boudaoud suggested testing Spektrum Tx/Rx of case device instead of attempting to recover PN code off of micro.
- ** Transmitter (if/when recovered) would be in good enough shape to transmit.
- ** Receiver needs electronics placed on donor board.
- ** PN code could potentially time consuming to acquire

TylerHowell 4/26/2013 0:00 ** Testing the link would give best results.

* Informed that the transmitter for this device might not be found.

TylerHowell 4/30/2013 0:00 ** Will not pursue obtaining the bind code from the receiver.

* Sent email requesting leads for Cypress and Horizon Hobby help in reading GUID and if GUID can be attributed to point of sale.

* Brandon Warhurst attempted to communicate with an exemplar SR201 over 5-pin header.

** 90 Hz pulse train on both data and clock line.

** Could possibly be a PWM signal, but unknown at this time.

TylerHowell 5/1/2013 0:00 ** Placing receiver into bind mode removes pulse train on pins.

* Removed RF can from Spektrum DX2E transmitter's RF module:

** CYRF6936 - a 2.4 GHz DSSS radio tranceiver from Cypress Semiconductor.

*** MISO/MOSI/SCK are *not* broken out to 12-pin header, instead connect to PSoC.

TylerHowell 5/2/2013 0:00 ** CY8C21434 - a Programmable System-on-Chip (PSoC) from Cypress Semiconductor.

X-rayed SR201 reciever:

TylerHowell 5/9/2013 0:00 * X-ray did not show any crack on die.

Reading GUID from Spektrum SR201:

TylerHowell 5/14/2013 0:00 * Successfully performed read of GUID from example SR201 using Cyrpress's minipro3.

TylerHowell 6/18/2013 0:00 * Started work on word document for device.

* Captured SPI traffic on example Tx

TylerHowell 6/21/2013 0:00 ** Used SS as a trigger, then CLK as another trigger to obtian 4M states

Attempted to read GUID from evidence RX:

* Cannot connect to device:

"FAILED! Can not Acquire Device! Please verify the device connection to the Programmer

Please, check the following items:

- the connection between the programmer and the PSoC;
- the correct programming protocol is selected;
- the correct connector option is selected."

* Impedence between power/ground is nominal.

* When powered, no current is drawn by device.

** Likely non-operational device.

Decoded SPI on TX module:

* MISO always contains 0x48 (0b0b01001000) - indicates improper communication.

** Unable to see any read results.

TylerHowell 6/24/2013 0:00 * Able to see writing of registers/values.

TylerHowell 6/25/2013 0:00 Decoded SPI communication using SPI parser and Logic Analyzer